Art. XXIII.—*Contributions to the Palæontology of the Older Tertiary of Victoria.*

Lamellibranchs—Part I.

(With Plate XII.)

By G. B. Pritchard.

[Read 8th November, 1894.]

By far the greater number of our Eocene Lamellibranchs have been described by Professor R. Tate of the University of Adelaide, and much credit is due to him for the treatment they have received at his hands. The Rev. J. E. Tenison Woods takes the next position, with a large number of species to his credit. For the remaining few we are indebted to the labours of Professor Sir F. McCoy, Professor Hutton, Professor Zittel, and Mr. R. M. Johnston. Since the above gentlemen wrote there have been very few new species added to this class, and as I have been fortunate enough to procure a few which are in want of names I will proceed to give their diagnoses.

Trigonia tatei, sp. nov.

(Plate XII., figs. 1, 2, 3.)

Shell thick, rotundate rhombic, somewhat convex, the antero-posterior diameter only differing in length from the umbo-ventral by about one or two millimetres; anterior margin broadly rounded, ventral margin nearly straight or very slightly convex, posterior margin nearly straight abruptly truncated making an angle of 145° with the hinge line, post-dorsal margin straight or slightly angled medially. Posterior slope convex, and ornamented with from 6 to 9 radiating obtusely rounded ribs, the siphonal ridge being by far the strongest and widest, interspaces wider than the ribs and showing the concentric lines of growth, ribs spinulosely ornamented, when worn generally nodulose, occasionally smooth; on the slope immediately under the dorsal margin [escutcheon] there are five very faint thread-like ribs

minutely spinulose near the beak. Middle and anterior portion of the valve bearing narrow-rounded undulating transverse ridges; the middle portion or that immediately anterior to the siphonal ridge being crossed by what appear to be impressed lines, number variable, generally about ten, frequently less, radiating from the beak to the ventral margin, shows the ripple-like ridges broken up into quadrangular nodes.

Dimensions.—Average of a number of specimens, antero-posterior diameter, 39 mm.; umbo-ventral diameter, 37 mm.; thickness through one valve, 11·5 mm.; thickness of shell, 3 mm. The largest example of the species I have yet seen has the following dimensions, antero-posterior diameter, 55 mm.; umbo-ventral diameter, 49 mm.; thickness of shell, 3·5 mm.

Locality.—Abundant in the Lower Eocene calcareous sands, Moorabool Valley, near Maude.

Observations.—This species may at first sight be confounded with *T. semiundulata*, McCoy, to which it is closely related, but upon examination may be easily distinguished from Sir F. McCoy's species by its much thicker, more solid, and more regularly convex shell, not so attenuate posteriorly, by the greater angle the posterior margin makes with the hinge line, the absence of flattening of the posterior slope, the straighter ventral margin, the smaller number of posterior radial ribs, and the less crowded transverse ridges. From our other fossil species of this genus, namely, *T. howitti*, McCoy, *T. acuticostata*, McCoy, and *T. tubulifera*, Tate, it is still more readily separable, as the first two have, like the recent species, radial ribbing only, while the third is a minute shell with well developed tubular projections on the transverse ridges as well as on the radial ribs.

The first examples of this species that came under my notice were in the collection of the Rev. A. W. Cresswell, M.A., of Camberwell, who had obtained his specimens from the Maude district. Subsequently I had an opportunity of visiting this district in company with Mr. T. S. Hall, and was able to collect a large series of specimens.

Species name in compliment to Professor Ralph Tate of the Adelaide University.

Myochama trapezia, sp. nov.

(Plate XII., figs. 8, 9.)

Shell trapezoidal elongate, moderately thick. Left valve free and very slightly convex, convexity more marked in the neighbourhood of the umbo, umbo sharply pointed and incurved immediately over the well marked triangular cartilage pit, anterior margin straight, dorsal margin straight, making an angle of 110° with the anterior margin and truncated at an angle of 125° posteriorly, anterior and posterior margins slightly rounded to join the convex ventral margin. Ornamented with concentric ridges or corrugations separated by somewhat broader shallow interspaces, a few faint radial wrinkles on the posterior slope. Right valve convex, frequently only partially attached by a limited portion of the dorsal surface, umbo free and ornamented with regular narrow concentric ridges, the concentric corrugations of the unattached ventral portion of this valve generally not so well defined as those of the left valve, faintly radially wrinkled anteriorly and posteriorly.

Dimensions.—Average right and left valves antero-posterior diameter, 26 mm.; umbo-ventral diameter, 18 mm.; largest example antero-posterior diameter, 29 mm.; umbo-ventral diameter, 22 mm.

Locality.—Eocene blue clays of Curlewis, Bellarine Peninsula. —Six examples. Eocene, lower beds at Muddy Creek, near Hamilton.—One example

Observations.—It is only recently that any fossil species of this genus have been recorded from the Victorian Tertiaries. Professor Tate, in a paper* on "Unrecorded Genera of the Older Tertiary Fauna of Australia," describes and figures two new species under this genus, *M. plana* from the Miocene of the Gippsland Lakes, and *M. rugata* from the Eocene of Spring Creek, and of the Gellibrand River. The new species herein described is closest related to *M. plana*, Tate, but differs from it most noticeably in outline, and in the more regular and well-developed concentric ridges, and in the absence of any umbonal radial corrugations. The new species appears to be commonly only partially attached by a limited portion of the dorsal region of the right valve to

* Proc. Roy. Soc. N.S.W., 1893.

such organisms as polyzoa, and on that account in all the specimens yet to hand the shape is fairly constant; but should wholly attached valves occur, as is not unlikely, the shape would then necessarily be greatly dependent upon the surface of attachment.

Pinna cordata, sp. nov.

(Plate XII, figs. 4, 5.)

Shell thin, triangular, elongate; valves very convex; dorsal half bearing about ten smooth longitudinal ribs increasing in breadth posteriorly, with shallow interspaces which also become broader posteriorly, but much more rapidly than the ribs; dorsal slope abrupt apically, becomes more gradual posteriorly, ultimately similar to the ventral slope; ventral half with numerous close-set concentric lines of growth, and broad well defined undulations parallel to the lines of growth becoming obsolete before reaching the dorsal ribs. In juxtaposition to the well defined dorsal ribs, and on the ventral slope there are four or five very faintly developed close and narrow longitudinal ribs becoming slightly stronger posteriorly. Dorsal margin at first straight, then rapidly ascending, giving it a distinctly concave aspect; ventral margin concave about the byssal orifice, then rapidly ecurved becoming regularly convex to the posterior end; posterior margin incomplete, apparently, from the aspect of the shell, gently rounded from the ventral margin.

Dimensions.—Length of dorsal margin (incomplete), 110 mm.; width, 55 mm.; greatest thickness through both valves, 39 mm.

Locality.—Eocene sandy limestones, Barwon River, near its junction with the Native Hut Creek. One example collected by Mr. J. Betheras.

Observations.—This species seems to be closest related to the South Australian Miocene species, *P. semicostata*, Tate, from the oyster beds of Adelaide and Aldinga Bay, but as far as I have been able to make out from Professor Tate's description and figure, the present species is a relatively narrower and more convex form, with a much more abrupt dorsal slope apically, and is without scales on the longitudinal ribs.

Cardita maudensis, sp. nov.

(Plate XII., figs. 6, 7).

Shell thick, rotundate oblong, somewhat depressed; umbo prominent incurved anteriorly; anterior region small, anterior margin gently convexly rounded to join the slightly convex ventral margin; dorsal margin straight, obtusely truncate posteriorly, some examples, particularly young shells, are not so noticeably truncate posteriorly, but appear slightly shorter and have their margins more regularly convexly rounded. Lunule small, depressed, narrow, elongate, cordate. Surface ornamented with nineteen or twenty comparatively broad closely nodulose radiating ribs, separated by narrower shallow concave interspaces, in which the concentric lines of growth are visible. The nodulose ornamentation of the ribs may be truncated spines, as some examples are inclined to be rather spinose anteriorly and posteriorly. Inner margin of the valves coarsely denticulate.

Dimensions.—Antero-posterior diameter, 10 mm.; umbo-ventral diameter, 9 mm.; thickness through both valves, 7 mm.

Locality.—Lower Eocene calcareous sands, Moorabool Valley near Maude. Fifteen examples.

Observations.—This species appears to be somewhat related to *C. delicatula*, Tate, and *C. tasmanica*, Tate, but from the former it differs by not being so abruptly truncate posteriorly, by the umbones not being so anterior, and by the fewer, broader, and much more coarsely ornamented ribs, and from the latter, apart from shape and dimensions, the present species has fewer and broader ribs and much narrower interspaces between the ribs.

Chione halli, sp. nov.

(Plate XII., figs. 10, 11, 12.)

Shell thin, tranversely oval, moderately convex as a rule, though occasional examples are somewhat depressed; umbo prominent, incurved anteriorly, situate about one-third the length of the shell from the anterior margin; lunule well defined cordate, much raised along the junction of the valves; shell anterior to the beak concave; anterior margin regularly convexedly rounded; post-dorsal margin at first gently sloping from

the beak backwards and downwards, practically straight, then roundly truncate to meet the very slightly convex ventral margin. The usual sized shell is ornamented with from 40 to 50 raised rounded narrow concentric ridges, which become lamellar anteriorly and posteriorly, interspaces very much narrower than the concentric ridges, becoming wider ventrally. The concentric ridges are so close as to prevent any radial ornamentation being seen at first, but, on holding the specimens with a strong light behind them, an exceedingly fine and close radial ribbing is just visible. Interiorly the shell margin is very minutely crenulated.

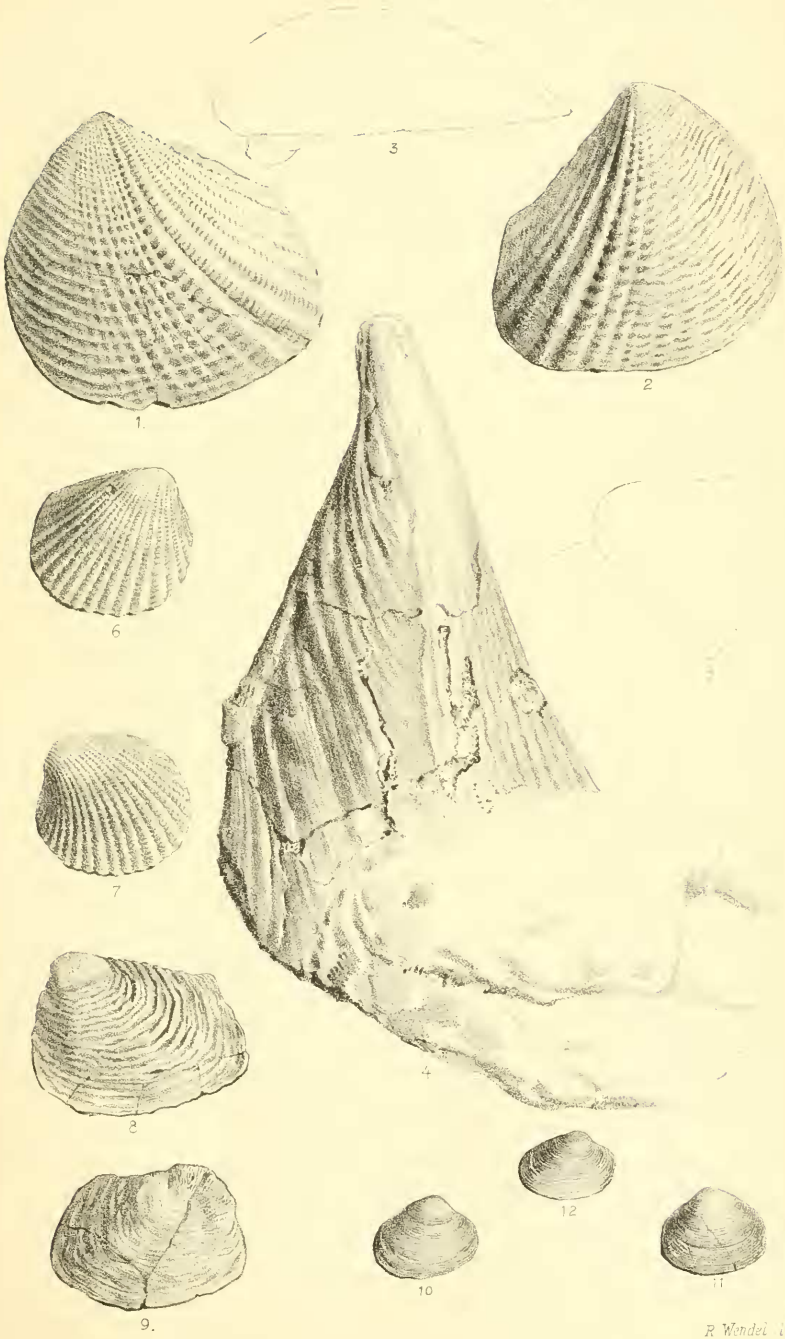
Dimensions.—Average specimens give the following measurements, antero-posterior diameter, 11·5 mm.; umbo-ventral diameter, 9 mm.; thickness through both valves, 6 mm. The largest specimen at present in my possession measures along its antero-posterior diameter, 16 mm., and umbo-ventral diameter, 13 mm.

Locality.—Common in the Lower Eocene sands and clays of Spring Creek, 14 miles south of Geelong.

Observations.—This species is very closely allied to *Chione propinqua*, T. Woods, but is a much smaller shell than the adult of that species; compared with young examples of *C. propinqua* of about the same size from the Miocene beds of Muddy Creek, the new species differs in form, is a thinner shell, is much more convex, the umbones are more prominent, the concentric ridges are finer and more numerous, the radial ribbing is obscure and is not continued on to the concentric ridges or lamellæ. These differences seem adequate to my mind to justify the proposal of a new specific name for this shell, particularly as they appeared very constant throughout my examination of upwards of sixty examples.

I have much pleasure in attaching to this shell the name of my friend, Mr. T. S. Hall, M.A., Demonstrator and Assistant-Lecturer in Biology at the Melbourne University.

In conclusion, I must express my indebtedness to Professor W. Baldwin Spencer, and tender to him my best thanks for photographing these shells for lithographic purposes.



R. Wendel